

Amendment and Response

Applicant: David Francischelli et al.

Serial No.: 10/056,806

Filed: January 25, 2002

Docket No.: M190.135.101

Title: SYSTEM AND METHOD OF PERFORMING AN ELECTROSURGICAL PROCEDURE

IN THE CLAIMS

Please cancel claim 12.

Please add claims 33-35 and amend claims 1, 13, 22, and 28 as follows:

1.(Currently Amended) A method of making a lesion at living tissue at a target site, the method comprising:

providing an electrosurgical system including:

an electrosurgical instrument having an electrode at a distal portion, and
a power source having multiple available power settings, wherein the power source is electrically connected to the electrode;

determining a desired depth for the lesion;

selecting a desired power setting for the power source, including considering a probability of pops during a subsequent electrosurgical procedure; and

applying electrical energy to the electrode in contact with the living tissue, the energy applied to the living tissue at the desired power setting for a recommended energization time period determined by reference to predetermined length of time information and based upon the desired lesion depth and the selected power setting;

wherein the step of selecting a desired power setting is completed prior to determining the recommended energization time period, and the recommended energization time period is determined prior to the step of applying electrical energy to the electrode.

2.(Original) The method of claim 1, wherein the predetermined length of time information correlates a plurality of lesion depth values with a plurality of power setting values and identifies an energization time period value for each lesion depth value and power setting value combination.

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3.(Original) The method of claim 2, wherein the recommended energization time period is determined by ascertaining the energization time period value identified by the predetermined length of time information that otherwise corresponds with the desired lesion depth and the selected power setting combination.

4.(Original) The method of claim 3, wherein the predetermined length of time information is embodied in a look-up table.

5.(Original) The method of claim 3, wherein the predetermined length of time information includes an algorithm.

6.(Original) The method of claim 3, wherein the electrosurgical instrument is further configured to distribute a liquid from a fluid source to a region of the electrode at a plurality of irrigation rates, and further wherein the predetermined length of time information is generated as a function of irrigation rate.

7.(Original) The method of claim 6, further comprising selecting a desired irrigation rate prior to the step of applying electrical energy and irrigating the electrode with the liquid during the step of applying electrical energy.

8.(Original) The method of claim 7, wherein the recommended energization time period is further determined based upon the selected irrigation rate.

9.(Original) The method of claim 8, wherein the predetermined length of time information includes a first correlation of lesion depth values with power setting values for a first irrigation rate and a second correlation of lesion depth values with power setting values for a second irrigation rate.

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10.(Original) The method of claim 9, wherein the predetermined length of time information includes a first look-up table embodying the first correlation and a second look-up table embodying the second correlation.

11.(Original) The method of claim 1, wherein determining a desired lesion depth includes:
estimating a thickness of the target tissue area.

12.(Cancelled)

13.(Currently Amended) The method of claim ~~12~~1, wherein selecting a desired power setting further includes:
considering a probable period of time for making the lesion.

14.(Original) The method of claim 13, wherein selecting a desired power setting further includes:
balancing a first risk associated with the probability of pops and a second risk associated with the probable period of time.

15.(Original) The method of claim 1, wherein the predetermined length of time information corresponds to a length of time needed for the electrosurgical system to create a lesion having a length of 1 cm.

16.(Original) The method of claim 1, further comprising:
drawing the electrode back and forth across the target tissue site during the step of applying electrical energy.

17.(Original) The method of claim 16, wherein the step of drawing the electrode back and forth results a first lesion segment upon completion of the recommended energization time period, the

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method further comprising forming a second lesion segment connected to the first lesion segment to define a lesion pattern.

18.(Original) The method of claim 17, wherein the lesion pattern is created as a part of a Maze procedure.

19.(Original) The method of claim 1, wherein the electrosurgical system further includes a controller storing the predetermined length of time information, and further wherein the recommended energization time period is determined by:

operating the controller to reference the predetermined length of time information.

20.(Original) The method of claim 19, wherein the controller includes an input device and a display device, and further wherein operating the controller includes:

inputting the desired lesion depth and the selected power setting via the input device;
automatically applying the desired lesion depth and the selected power setting to the
predetermined length of time information to determine the recommended
energization time period; and
displaying the recommended energization time period via the display device.

21.(Original) The method of claim 19, wherein the controller further includes a warning device, the method further comprising:

activating the warning device upon completion of the recommended energization time
period.

22.(Currently Amended) An electrosurgical system for performing an electrosurgical procedure on living tissue, the system comprising:

an electrosurgical instrument having ~~an electrode at a distal portion~~ a handle, an
elongated, insulated shaft rigidly extending from the handle and an electrode on
the shaft, the electrode spaced from the handle, the instrument adapted to create a

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linear lesion having a length on the tissue by grasping the handle and manipulating the rigidly connected electrode to contact the tissue with a drawn back-and-forth motion along the length;

a power source having multiple available power settings and being electrically connected to the electrosurgical instrument for selectively energizing the electrode; and

an energization look-up table corresponding with the electrosurgical instrument, the energization look-up table including:

a power setting data set that includes at least two of the multiple available power settings of the power source,

a lesion depth data set,

energization time period information organized as a dependent variable of the power setting and lesion depth data sets;

wherein the energization look-up table is adapted to identify a recommended energization time period ~~based upon a cross reference of a selected power setting relative to the power setting data set and a desired lesion depth relative to the lesion depth data set~~ and power setting based upon a desired lesion depth by a cross-reference between energization time and power setting for minimizing a possibility of pops during an electrosurgical procedure.

23.(Original) The system of claim 22, further including:

a fluid source fluidly connected to an internal lumen of the electrosurgical instrument, the fluid source being configured to supply a liquid to a region of the electrode at an irrigation rate during an electrosurgical procedure.

24.(Original) The ablation system of claim 23, wherein the energization look-up table correlates the energization time period information with a desired irrigation rate.

25.(Original) The system of claim 22, wherein the system further comprises:

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a controller electronically storing the energization look-up table, wherein the controller is adapted to convert the selected power setting and the desired lesion depth into a recommended energization time period based upon reference to the energization look-up table.

26.(Original) The system of claim 25, wherein the controller is electrically connected to the power source, and further wherein the controller is configured to control the power setting of the power source.

27.(Original) The system of claim 26, wherein the controller is adapted to automatically deactivate the power source upon completion of the recommended energization time period.

28.(Currently Amended) An electrosurgical system for performing an electrosurgical procedure, the electrosurgical system comprising:

an electrosurgical instrument having ~~an electrode at a distal portion~~ a handle, an elongated shaft extending from the handle and an electrode on the shaft, wherein the shaft is characterized as being more rigid than a catheter for manipulating the electrode to engage tissue in a drawn back-and-forth manner;

a power source having multiple available power settings and being electrically connected to the electrosurgical instrument for selectively energizing the electrode; and

a controller for electronically selecting a recommended energization time period by reference to predetermined length of time information that relates to the electrosurgical instrument and based upon a power setting selected prior to energizing the electrode at a power level to minimize the possibility of pops and a desired lesion depth.

29.(Original) The system of claim 28, wherein the electrosurgical device includes an internal lumen fluidly connected to at least one passage formed in the electrode, and wherein the electrosurgical system further includes:

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a fluid source fluidly connected to the internal lumen, the fluid source being configured to supply a liquid to the at least one passage at a selected irrigation rate during the electrosurgical procedure.

30.(Original) The system of claim 29, wherein the controller is further adapted to determine the recommended energization time period based upon the selected irrigation rate.

31.(Original) The system of claim 28, wherein the controller is electrically connected to the power source and is adapted to automatically deactivate the power source upon completion of the recommended energization time period.

32.(Previously Presented) The method of claim 1, wherein the step of selecting a desired power setting is performed by a surgeon.

33.(New) A method of making a lesion at living tissue at a target site, the method comprising:

providing an electrosurgical system including:

an electrosurgical instrument having an electrode at a distal portion, and
a power source having multiple available power settings, wherein the power source is electrically connected to the electrode;

determining a desired depth for the lesion;

selecting a desired power setting for the power source;

determining a recommended energization time period by reference to predetermined length of time information and based upon the desired lesion depth and the selected power setting;

contacting the living tissue at the target site with the electrode; and

applying electrical energy to the electrode at the selected powered setting for the recommended energization time period while drawing the electrode back-and-forth across the living tissue at the target site.

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34.(New) The method of claim 33, wherein determining a recommended energization time period includes accounting for movement of the electrode.

35.(New) An electrosurgical system for performing an electrosurgical procedure on living tissue, the system comprising:

an electrosurgical instrument having an electrode at a distal portion;

a power source having multiple available power settings and being electrically connected to the electrosurgical instrument for selectively energizing the electrode; and

an energization look-up table corresponding with the electrosurgical instrument, the energization look-up table including:

a power setting data set that includes a least one of the multiple available power settings,

a lesion depth data set,

energization time period information organized as a function of the power setting and lesion depth data sets, and

energization time period values for an electrode being drawn back-and-forth across tissue as a function of power and lesion depth.